The Canadian Entomologist

LXII ORILLIA, DECEMBER, 1930. No. 12

AN ECOLOGICALLY ANNOTED LIST OF THE PHALAENIDAE OF MONTANA (LEPID.)*

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(Continued from page 264)

E. ternaria (group). Two specimens so named were captured at Three Forks Aug. 19, 1925 and Sept. 4, 1926.

1310 *E. atropulverea* Sm. One specimen in Smith collection taken at Butte, Aug. 28, 1900, by R. A. Cooley. One specimen from Bozeman, Aug. 27, 1929.

1310, 1 *E. setonia* McD. One specimen taken at Three Forks July 22, 1926 by C. B. Philip.

1315 *E. quinquelinea* Sm. Several specimens taken in August and September at Bozeman and Three Forks have been referred to the "*quinquelinea* group" by McDunnough. We have four definite records for *quinquelinea lutulenta* Sm. from localities near Bozeman. One larva was taken with *E. ridingsiana* on phlox.

1316 *E. lucida* B. & McD. A form which McDunnough refuses to place except as "near *lucida*" is fairly common in the Three Forks country. August-September. For the present we are carrying it under this name although it may prove to be some other closely related species.

1319 *E. vulpina* Sm. Three specimens are recorded from Bozeman in September and October 1928.

1325 *E. pedalis* Sm. Occasionally captured near Three Forks in August and September. One specimen from Malta, Sept. 6, 1928.

1328 *E. murdocki* Sm. Quite common at Hamilton, August and September.

1329 *E. tessellata* Harr. Statewide in distribution. Common everywhere. July-August. The forms *atropurpurea* Sm., *nordica* Sm. and *tesselloides* Grt. also occur.

1333a *E. atomaris detesta* Sm. Two specimens from Miles City Sept. 5 and 19, 1929.

1336 *E. pleuritica* Grt. Fairly common in Intermountain and northern Plains regions, rare elsewhere. July-August. One larva was reared from Russian thistle in 1921.

1337 *E. pestula* Sm. One specimen Three Forks June 29, 1929. This and the preceding species should prove fairly common in the northern Plains area if collections were made at flowers. They do not come readily to light.

1338 *E. declarata* Wlk. Intermountain and Pacific slope. August and September. Common.

1339 *E. campestris* Grt. The geographic and seasonal distribution of this species are the same as for *declarata*. It is difficult to separate the two species and most of our records for the two species are under *declarata* which is much more abundant.

1340 *E. verticalis* Grt. One specimen from Billings, July 27, 1908. One speci-

men from Bozeman, July 29, 1926. It is possible that further records of this species are mixed with *declarata*

1341 *E. albipennis* Grt. Common everywhere except in the southern Plains region. August-September. The larva has been reared from potato, corn, sunflowers, sweet clover, lupines and loco (*Aragalus* sp.). This species apparently hibernates in the egg stage and the larvae are found quite late in June. There is a long prepupal period. There is one record of the form *malis* Sm. from Three Forks and doubtless this and form *bialba* Sm. are both fairly common although no attempt has been made to separate them.

1351 *E. munis* Grt. One specimen reared from a larva picked up on sugar beets near Bozeman in September 1910 (with *E. tristicula*).

1352 *E. rena* Sm. Intermountain and Pacific slope regions. July-August. This species and variety *cervinea* Sm. occur fairly commonly at Hamilton and Bozeman. The reddish form (*rena*) is most common at Hamilton while *cervinea* Sm. is dominant at Bozeman. This latter variety was described from Bozeman material.

1353 *E. divergens* Wlk. Intermountain and Pacific slope regions. June to August. Common. Larvae of this species have been found in alfalfa in the Gallatin Valley. It is possible that it hibernates as a very young larva as these specimens pupated in May.

1353a *E. divergens abar* Stkr. This variety occurs with *divergens* but is rather rare.

1356 *E. obeliscoides* Guen. Occurs throughout the State except in the southern Plains region. Rare everywhere. August-September.

1357 *E. redimicula* Morr. Common in Intermountain and Pacific slope regions. July to September.

1357a *E. redimicula servitus* Sm. One specimen from Malta July 21, 1929.

1358a *E. costata idahoensis* Grt. This species is extremely variable and there are three quite well marked forms present in the State. A dark brown form, to which possibly the name *furtiva* Sm. might be applied, is common everywhere except in the southern Plains region. A gray form is quite common in the Three Forks region but does not extend into the mountains. A light brown form which McDunnough has seen from Utah occurs fairly common at Three Forks. All three forms fly together from June to August. Larvae have been reared from Russian thistle, sweet clover and *Astragalus bisulcatus*. There is a very short prepupal period.

1358, 1 *E. clausa* McD. Common at Three Forks in July and August. Two specimens from Malta and one from Miles City.

1361 *E. basalis* Grt. Fairly common everywhere except in the southern Plains region. July and August.

1363 *E. ochrogaster* Guen. Statewide in distribution. July-September. Occasionally of economic importance. This is the "red-backed cutworm," which is a serious pest in Saskatchewan and Alberta. The forms *insignata* Wlk. and *gularis* Grt. are about as common as the typical form. We have many records of damage to various crops but especially to sugar beets.

1365 *E. atrifera* Grt. Statewide in distribution, most common in the Intermoun-

tain and Pacific slope regions. August-September.

1368 *E. tristicula* Morr. Abundant everywhere except in the southern Plains region. This species hibernates as a half grown larva and the moths fly in June and July. The variety *nesilens* Sm. occurs with the typical form but in very small numbers. Larvae have been found on sugar beets, winter wheat and weeds, especially Russian thistle. Investigation of several reports shows that this species occurs only in weedy fields where Russian thistle is abundant. While this species may attack wheat at times, yet Russian thistle is a greatly preferred food plant. *Tristicula* is very important as a winter host for many parasites which attack other species in the spring.

1369 *E. brocha* Morr. Intermountain and Pacific slope regions. August-September. Common.

Chorizagrotis Sm.

1372 *C. auxiliaris* Grt. Statewide in distribution. Moths fly from June to October. This is the "army cutworm" which has a long economic record for damage to wheat. It hibernates as a partly grown larva, pupates fairly early in May and the moths emerge late in June. The moths feed on flowers for two or three weeks after which they aestivate until about the first of September when they again feed, mate and lay their eggs. This aestivation is quite closely connected with the night temperatures and in relatively cool summers they may be found on the wing very late at night during July and August. At this time they seem to feed only at temperatures considerably below 60°F. The various forms of this species have recently been treated elsewhere. (Can. Ent. 1930, LXII, 147).

1379 *C. thanatologia* Dyar. Intermountain and Pacific slope regions. July-August. Rare. There are two forms of this species recorded from the State, a reddish form somewhat resembling *E. ochrogaster gularis,* and the form *perfida* Dod. This latter form is somewhat more common.

Protexarnis McD.

1376 *P.* (*Chorizagrotis*) *balanitis* Grt. Common in the northern Plains and Intermountain regions. June-September. A single adult of this species was reared from a collection of army cutworms picked up near Three Forks in 1921. The life history is unknown but it seems possible that the moths aestivate.

Pseudorthosia Grt.

1468 *P. variabilis* Grt. Intermountain and Pacific slope. August-September. Rare.

Richia Grt.

1544 *R. chortalis* Grt. Two specimens from Hamilton, Aug. 24, 1927.

1542 *R. parentalis* Grt. One specimen from Three Forks, Aug. 29, 1926.

Onychagrotis Hamp.

1467 *O. rileyana* Morr. Common in the Plains region, rare in Intermountain region. August-September.

Agrotis Ochs.

1234 *A.* (*Porosagrotis*) *vetusta* Wlk. Statewide in distribution. Most common in the Plains region. August-September. Nothing is known of its life history or food plants in this State.

1228 *A.* (*Porosagrotis*) *daedalus* Sm. One specimen Malta June 5, 1929.

1233 *A.* (*Porosagrotis*) *orthogonia* Morr. Pale Western cutworm. Abundant

everywhere except in Pacific slope region where only one or two captures have been made. August-September. This species has a large economic bibliography.

1397a *A.* (*Feltia*) *venerabilis arida* Ckll. Very common in the Plains area. August-September. The larva has been collected on dandelion and mustard and was also picked up with army cutworms on wheat in 1927. The larva has a very prolonged dormant period and the peak of flight is in September.

1408 *A.* (*Feltia*) *vancouverensis* Grt. Common in Intermountain and Pacific slope regions. May to July. The variety *semiclarata* Grt. also occurs in the Intermountain region. The larva was collected once on fall wheat in May. It is probable that this species winters in the pupal stage. Every season the full grown larvae can be picked up on the campus at Bozeman in October, wandering around in the day time apparently searching a place to hibernate. If these are caged they pupate within a few days and if they are held out doors the moths emerge in the spring.

1409 *A.* (*Feltia*) *volubilis* Grt. This species occurs with *vancouverensis* but is much more rare. It seems most common in the Intermountain region.

1422 *A. ypsilon* Rott. Statewide in distribution. Not common anywhere. September-October.

Feltia Wlk.

1402 *F. ducens* Wlk. Abundant everywhere. July-September. Larvae have been collected with army cutworms on fall wheat in May. Wild food plants are dandelion, fanweed, hare's-ear mustard, sweet clover and lupines. This is one of the earliest larvae to be found in the spring. It winters as a partly grown larva, ceases feeding in May and has a prolonged prepupal period.

1401 *F. hudsoni* Sm. One specimen, Bozeman, Aug. 8, 1928. It is probable that other specimens of this species have been recorded as *ducens*. The differences are not very marked, and large numbers of *ducens* are handled every season.

1403. *F. subgothica* Haw. A few specimens from Bozeman in July and August.

1404 *F. herilis* Grt. Statewide in distribution. This species varies widely in abundance in different season. At times it has been common at Bozeman, Hamilton, and Miles City. Moths fly in July and August.

Actebia Steph.

1446 *A.* (*Agrotis*) *fennica* Steph. A few specimens have been collected from various points in the state but it is rare everywhere. Moths fly in September.

Protogygia McD.

1390. *P.* (*Rhizagrotis*) *lagena* Grt. Intermountain and Pacific slope regions. June-July. Rare.

Spaelotis Bdv.

1461 *S. clandestina* Harr. (*Agrotis unicolor* Wlk.) Statewide in distribution, common everywhere. June-September. The life history of this species is similar in all respects to that of the army cutworm and it has been collected with this species in many cases. One of the preferred food plants is sage brush, and when a mixed army of *auxiliaris* and *clandestina* passes through a field containing much sage the latter species is often left behind. Nearly full grown larvae are quite often seen feeding on the petals of various wild perennials in May.

1462 *S.* (*Agrotis*) *havilae* Grt. This species occurs with *clandestina*. It seems more common in the Plains region than elsewhere.

Eurois Hbn.

1489. *E.* (*Lycophotia*) *occulta* Linn. Intermountain and Pacific slope regions. July. Rare. One larvae of this species was picked up in a low marshy area near Bozeman in April 1924.

1487 *E.* (*Lycophotia*) *astricta* Morr. Intermountain and Pacific slope regions. July-September. Rare.

1488 *E.* (*Lycophotia*) *nigra* Sm. Intermountain and Pacific slope regions. August-September. Rare.

Ochropleura Hbn.

1434 *O.* (*Agrotis*) *plecta* Linn. Intermountain and Pacific slope regions. June-July. Rare.

Euagrotis McD.

1501 *E.* (*Lycophotia*) *exuberans* Sm. Three specimens. Hamilton, June 9, 1925; Malta, June 25, 1928; Three Forks, July 6, 1928.

1499 *E.* (*Lycophotia*) *tepperi* Sm. Northern Plains region. June-July. Common.

Metalepsis Grt.

1474 *M.* (*Epipsilia*) *salicarum* Wlk. One specimen from Bozeman, May 11, 1928, one from Hamilton, April 26, 1929.

Peridroma Hbn.

1490 *P.* (*Lycophotia*) *margaritosa* Haw. Common in Pacific slope region, rare elsewhere. June-August. Eggs have been collected on apple in the Bitter Root Valley. Larvae were found on *Capsella Bursa-pastoris* at Bozeman. This is the variegated cutworm which is a serious pest in the eastern states. The form *saucia* is apparently as common as the typical form.

Paradiarsia McD.

1477. *P.* (*Epipsilia*) *littoralis* Pack. This species and the variety *pectinata* Sm. are very common at Bozeman and quite common at Malta. May-July.

Pseudospaelotis McD.

1458 *P. haruspica* Grt. (*Agrotis unimacula* Morr.) One specimen, Malta July. 22, 1929; two specimens Miles City, Aug. 12 and 15, 1929.

1457 *P.* (*Agrotis*) *sierrae* Harv. Intermountain and Pacific slope regions. July Rare. This is probably only a mountain form of *haruspica*.

Caradrina Ochs.

1484 *C.* (*Epipsilia*) *quadrangula* Zett. One specimen, Hamilton, September 14, 1928.

Chersotis Bdv.

1450 *C.* (*Agrotis*) *juncta* Grt. Intermountain and Pacific slope regions. July-August. Rare. The variety *patefacta* Sm. is probably also present but has not been separated.

Diarsia Hbn.

1436 *D.* (*Agrotis*) *calgary* Sm. One specimen from Bozeman in July. One specimen from Middle Creek Canyon near Bozeman also in July.

1437a *D.* (*Agrotis*) *cynica perumbrosa* Dyar. One specimen, Bozeman, July 23, 1928.

1435 *D.* (*Agrotis*) *rosaria* Grt. Three specimens from Bozeman in June and July.

Graphiphora Ochs.

1424 *G.* (*Agrotis*) *c-nigrum* Linn. Common in Pacific slope region. First brood moths fly in June, second brood, August to October.

1430 *G. smithi* Snell, (*Agrotis baja* Auct.). Fairly common at Bozeman in July and August. A few scattered specimens from Hamilton and Miles City.

1447 *G.* (*Agrotis*) *oblata* Morr. Intermountain and Pacific slope regions. June-July. Rare.

1449 *G.* (*Agrotis*) *substrigata* Sm. One specimen, Bozeman, August 4, 1929.

1423 *G.* (*Agrotis*) *collaris* G & R. Intermountain and Pacific slope regions. July-August. Rare. Two or three scattered specimens from Malta and Miles City.

1431 *G. tenuicola* Morr. (*Agrotis treati* Grt.) Three specimens from Bozeman in July and August.

Setagrotis Sm.

1455b *S.* (*Agrotis*) *planifrons* Sm. Intermountain and Pacific slope regions. July to September. Rare. Rather common at Hamilton in certain seasons, but generally rare.

1485 *S.* (*Lycophotia*) *radiatus* Sm. Collected only at Three Forks in August and September, where it is quite rare.

1453 *S.* (*Agrotis*) *atrifrons* Grt. Two specimens from Hamilton, June 28 and July 12, 1925.

1454c *S.* (*Agrotis*) *piscipellis corrodera* Sm. Two specimens from Hamilton, July 30, 1925; Aug. 25, 1929.

Anomogyna Staud.

1540 *A. infimatis Grt.* One specimen, Hamilton, August 11, 1927.

Anaplectoides McD.

1510 *A.* (*Aplectoides*) *pressus fales* Sm. One specimen from Hamilton in 1925; three from the general vicinity of Bozeman. July and August.

1560 *A.* (*Matuta*) *prasina* Fab. Three specimens from Hamilton in July and August.

Protolampra McD.

1565 *P.* (*Rhynchagrotis*) *rufipectus* Morr. Intermountain and Pacific slope regions. August-September. Rare.

Cryptocala Benj.

1596 *C. acadiensis* Beth. (*Rhynchagrotis gilvipennis* Grt.) Apparently statewide in distribution, but very rare everywhere except in the Pacific slope region. July.

Eucretagrotis Sm.

1598 *E. perattenta* Grt. Five specimens from Bozeman and Hamilton in June and July. Two of these were identified by McDunnough as *inattenta* Sm. In 1926 he stated his inability to separate these two species but in 1928 he identified one specimen as *inattenta* so that this name may apply to the whole series. One larva of this species was picked up in a low marshy area near Bozeman in April 1924.

Hemigraphiphora McD.

1442 *H.* (*Agrotis*) *plebeia* Sm. One specimen from Three Forks July 27, 1925. About ten specimens from Hamilton in July and August, scattered over five years.

Abagrotis Sm.

1562 *A. erratica ornatus* Sm. Pacific slope region. July-August. Common.

1580 *A.* (*Rhynchagrotis*) *vittifrons* Grt. Common at flowers in the Three Forks country. August-September. One specimen each from Hamilton and Bozeman.

1503 *A.* (*Lycophotia*) *nanalis* Grt. Fairly common at Three Forks on flowers, August-September. Single specimens from Miles City, Aug. 19, 1929 and Hamilton, Aug. 24, 1928. This species and the preceding one are rather difficult to capture at flowers because of a peculiar habit of diving with closed wings at the slightest disturbance of the plant. It is often possible to take advantage of this habit and hold the collecting jar in such a position that they will dive into it.

1582 *A.* (*Rhynchagrotis*) *mirabilis* Grt. One specimen, Three Forks, Aug. 27, 1925.

1587 *A.* (*Rhynchagrotis*) *sambo* Sm. One specimen Three Forks July 17, 1927, and one from Hamilton, Aug. 12, 1928.

1585 *A.* (*Rhynchagrotis*) *placida* Grt. Statewide in distribution. August-September. Rare everywhere.

1585, 1 *A.* (*Rhynchagrotis*) *barnesi* Benj. One specimen Havre, Sept. 10, 1922 and one from Hamilton in 1928.

1591 *A.* (*Rhynchagrotis*) *duanca* Sm. Three specimens from Three Forks. August-September. Two specimens from Malta, July 21 and 23, 1928.

1584 *A.* (*Rhynchagrotis*) *nefascia* Sm. Statewide in distribution. July-August. Rare everywhere.

1594 *A.* (*Rhynchagrotis*) *variata* Grt. Pacific slope region. August. Rare.

1595 *A.* (*Rhynchagrotis*) *scopeops* Dyar. Two specimens from Hamilton in August.

Rhynchagrotis Sm.

1572 *R. exsertistigma* Morr. Five specimens from Intermountain and Pacific slope regions in August and September. Four specimens from Butte, Aug. 28, 1900 are in the Smith collection bearing the name *inelegans* Sm. The form *morrisonistigma* Grt. is the most common in Montana.

1569 *R. insularis confusa* Sm. About ten specimens from Hamilton in August and September. Two specimens from Three Forks, Sept. 1 and 3, 1927.

Pronoctua Sm.

1602 *P. pyrophyloides* Harv. One specimen from Three Forks, July 9, 1925

Ufeus Grt.

The Montana species in this genus all hibernate in the moth stage and the moths are caught from October until May. We have several records of moths of this species flying into our building during warm spells in the winter. The larvae feed in colonies on the inner bark of the cottonwood tree and moths have several times been reared from such colonies. Carter (Can. Ent. 54: 25) has recorded some observations on the life history of *Ufeus plicatus* Grt.

1520 *U. hulsti* Sm. Fairly common in Intermountain and Pacific slope regions. This species is doubtfully distinct from the following.

1522 *U. plicatus* Grt. Statewide in distribution. Has been reared from larvae sent in from Melstone in southeastern Montana, Toston in Central Montana and Thompson Falls in northwestern Montana.

1523 *U. satyricus* Grt. Intermountain and Pacific slope regions. Less common than the preceding species.

HADENINAE

Barathra Hbn.

1606 *B. configurata* Wlk Occurs throughout Montana except possibly in the southern Plains region. More common in the mountainous sections. The moths do not come freely to light, so our records are probably very inaccurate. This species is the "Bertha army worm" of Saskatchewan and Alberta and its life history has been recently studied by King. (Jour. Econ. Ent. 21: 279-293).

Scotogramma Sm.

1615 *S. trifolii* Rott. This species is statewide in distribution and abundant everywhere. There are two generations and during most of its life the larva feeds openly on Russian thistle plants. The first generation moths fly in May and June, the second generation mainly in August. There is considerable overlapping and at times there appears to be a continuous flight of moths from May until September. The larva of this species is rather remarkable. During the first three or four instars it is a typical cutworm in appearance, of a dingy brown color somewhat resembling *Feltia ducens*. In the last two or three instars it is a bright green larva with no obvious markings aside from pink and white longitudinal stripes and some whitish flecks. In Montana the larvae have only been recorded from pigweed and Russian thistle.

1616 *S. mutata* Dod. Distribution statewide. This species flies with *trifolii* and probably has a similar life history, but is much less common.

The remaining species in this genus have only been definitely separated by McDunnough during the past winter so that our records are very incomplete.*

1617 *S. oregonica* Grt. Intermountain and Pacific slope regions. July-August. Rare.

1617a *S. oregonica morana* Sm. Scattered specimens of this form are recorded from all parts of the State except the Southern Plains. It is rare everywhere, and moths fly in June and July.

1619a *S. fervida proxima* B & B. Six specimens from Malta, May 25 to June 5, 1929.

1626. *S. submarina* Grt. Two specimens from Miles City, May 20 to Aug. 24, 1929.

1626. 1 *S. alta* B & B. Fairly common at Bozeman in June and July.

Lasionycta Auriv.

1650 *L. perplexa* Sm. One specimen Bozeman July 1923, and one from Hamilton, July 13, 1928.

Polia Ochs.

1657 *P. lustralis* Grt. A few scattered specimens from Bozeman in June and July:

*vide Can. Ent. 1930, LXII, 180. Ed.

five specimens from Malta, June 14 to 29, 1928. A single larva picked up among cottonwood leaves in a flood plain area in 1924 pupated May 28 and emerged July 3.

1659a *P. detracta neoterica* Sm. One specimen from Hamilton, June 29, 1929.

1660 *P. discalis* Grt. Intermountain and Pacific slope regions. May-July. Rare

1661 *P. imbrifera* Guen. Intermountain and Pacific slope regions. June-July. Rare.

1663 *P. nugatis* Sm. Intermountain and northern plains regions. August-September. Rare. This species comes to light in numbers much larger than would be indicated by its general abundance in the vicinity.

1665 *P. purpurissata* Grt. Common in Intermountain and Pacific slope regions, rare elsewhere. July-August.

1666 *P. crotchi* Grt. Intermountain and Pacific slope regions. May-June. Rare. Scattered specimens from other parts of the State.

1671 *P. columbia* Sm. Collected only east of the Continental Divide. July-August. Rare.

1673 *P. meditata* Grt. Three specimens from Malta, July 20 to 26, 1929. These specimens were indentical with eastern *meditata* and represented the darkest specimens of a series which graded into typical *columbia* at the lighter end.

1685 *P. grandis* Bdv. One specimen from Malta, June 5, 1929.

1686 *P. subjuncta* G & R. Intermountain and Pacific slope regions. July. Rare. One specimen from Havre, in 1922.

1687 *P. nevadae* Grt. Intermountain and Pacific slope regions. June-July. Rare. One specimen from Malta, Sept. 19, 1929.

1688 *P. ingravis* Sm. Two specimens from Hamilton and three from Bozeman. May-June.

1689 *P. obesula* Sm. Intermountain region. July. Rare. One specimen from Malta, July 14, 1928.

1693 *P. cristifera* Wlk. Intermountain and Pacific slope regions. June-July. Rare. One specimen from Miles City, June 9, 1929.

1702 *P. variolata* Sm. Three specimens from Hamilton in July.

1705 *P. farnhami* Grt. Present throughout the State except in the southern Plains region, most common in the Intermountain region. May-June. Rare.

1707 *P. liquida* Grt. Intermountain region. A few specimens have been found in our large series of the following species which approach this form very closely. One specimen was referred to McDunnough in 1927 and he remarked, "If this came from Vancouver Island I would call it *liquida*."

1708 *P. meodana* Sm. Intermountain and Pacific slope regions. June-July. Abundant. This is very abundant at Bozeman in certain seasons. I have one specimen from Malta, July 5, 1928.

1709 *P. tacoma* Stkr. A few scattered specimens from Bozeman, Hamilton and Malta in May and June.

1710 *P. atlantica* Grt. Abundant in Intermountain region, rare elsewhere. June to August. The larva has been picked up once or twice on clover and alfalfa.

1712 *P. radix* Wlk. Scattered specimens from Bozeman, Hamilton and Malta. June-July.

1713 *P. sutrina* Grt. Intermountain and Pacific slope regions. July-August. Rare.

1716 *P. dodi* Sm. Fairly common in the Intermountain region in certain seasons. June-July. A few specimens from Hamilton.

1717 *P. lilacina* Harv. This species and the form *illabefacta* Morr. occur throughout the State. The typical form is generally less rare than *illabefacta* although neither is very common. July-August.

1718 *P. goodelli* Grt. One specimen from Bozeman, July 1, 1925 and two from Hamilton June 7 and 13, 1929.

1719 *P. acutermina* Sm. One specimen from Miles City, Aug. 7, 1929.

1723 *P. assimilis* Morr. Three specimens from Bozeman in July-August.

1724 *P. noverca* Grt. Fairly common in southern Plains region. Scattered specimens from Hamilton and Bozeman. May-July.

1734 *P. vicina* Grt. The forms in this group are quite difficult to separate and the records for *vicina*, *pensilis* Grt. and *doira* Stkr. are somewhat mixed. Apparently *vicina* and *pensilis* are mountain forms, while *doira* occurs more commonly on the plains. There is some evidence that there may be two generations per year. *Vicina* is common in the Intermountain and Pacific slope regions in June and July and quite a few specimens were taken at Miles City in 1929.

1735 *P. acutipennis* Grt. A few scattered specimens of this form have been captured at Bozeman and Hamilton in June and July. McDunnough regards this as a form of *vicina*.

1736 *P. pensilis* Grt. Four specimens from Hamilton in August and September.

1737 *P. doira* Stkr. Very common in northern Plains and Intermountain regions. July-September. At Malta in 1928, there was practically a continuous flight from June 14 to September 18.

1739 *P. larissa* Sm. One specimen from Hamilton, June 25, 1928.

Polia sp. A small series of a species belonging in this general group was secured from Hamilton, Three Forks and Malta in May and June in 1929. These have not yet been identified.

1750 *P. renigera* Steph. Statewide in distribution, more abundant in Intermountain and Pacific slope regions. June-August. This species is supposed to have two generations further east but we have never had any evidence of a second generation in Montana.

1751 *P. stricta* Wlk. This species and the form *tenisca* Sm. are common in the Intermountain and Pacific slope regions. The reddish form *stricta* is most abundant at Hamilton where *tenisca* is rare, while *tenisca*, which was described from Bozeman, far outnumbers the typical form in that vicinity. August-September. The larva matures in early July and has a fairly long prepupal period. They have been found on dandelion.

1754 *P. lorea* Guen. This eastern species is fairly common in the irrigated portions of Montana. June-July. Larvae occur on clover and alfalfa in April and May. It is probable that this species hibernates as a partly grown larva.

1755 *P. olivacea* Morr. Statewide in distribution. July-September. The typical form apparently does not occur in the State but the forms *altua* Sm. and *davena* Sm. are fairly common in the Intermountain and Pacific slope regions. A few specimens of the form *lucina* Sm. are recorded flying in July and August. The records of flight show no indication of more than one generation a year, but in 1919 Mr. Kenneth King reared a larva from eggs laid July 23, which pupated in the middle of September and emerged in October, under insectary conditions. This may indicate the possibility of a partial second generation from eggs laid by the earliest moths to emerge. The larva feeds on a variety of plants.

1756 *P. laudabilis* Guen. One specimen from Miles City, July 17, 1929.

1757 *P. illaudabilis* Grt. A few scattered specimens from Hamilton, Three Forks and Miles City in July and August.

Neuria Guen.

1778 *N. procincta* Grt. A few scattered specimens from Hamilton, Bozeman and Havre in June and August. Most common at Hamilton.

Tholera Hbn.

1779 *T. americana* Sm. Probably statewide in distribution, rare everywhere. August-September.

Epia Hbn.

1780 *E. capsularis* Guen. Three specimens from Hamilton and Bozeman in June and July.

1783 *E. circumvadis* Sm. Two specimens from Bozeman, July 5 and 15, 1928 and one from Malta June 27, 1929.

1783, 1 *E. jola* B. & B. This species suddenly appeared in 1928, when several specimens were captured at Bozeman and Hamilton. A few more came in 1929. May-June.

Trichoclea Grt.

1786 *T. antica* Sm. Eight specimens from Malta and Miles City and one from Hamilton in May and June.

1789 *T. fuscolutea* Sm. One specimen from Hamilton, June 1, 1928.

1790 *T. u-scripta* Sm. One specimen from Hamilton, June 29, 1929.

1791 *T. artesta* Sm. Seven specimens from the Plains region in June and July.

Hyssia Guen.

1810 *H. dilecta* Hy. Edw. One specimen from Bozeman, June 24, 1925.

1811 *H. orbiculata* Sm. Northern Plains and Intermountain regions. May-June. This species is probably fairly common as quite a large number were collected feeding at the flowers of willow in a canyon near Bozeman on May 21, 1928. None of our light traps have been located in such situations, but a few scattered specimens have been captured at Bozeman, Three Forks and Malta.

Eriopyga Guen.

1813 *E. curtica* Sm. Common in the Pacific slope region. August-September. One specimen from Three Forks, Aug. 24, 1927.

1814 *E. akalus* Stkr. Common in the Three Forks country, August and September.

1817 *E. utahensis* Sm. Very common in the Plains region, August and September.

1821 *E. oviduca* Guen. Common at Bozeman in June and July. One specimen from Malta, May 29, 1929.

1822 *E. melanopis* Hamp. Two specimens from Bozeman in June and one from Havre in July.

These five forms of Eriopyga seem quite local in their distribution. It seems possible that the first three may represent local races of one species as their time of flight is similar and their distribution does not overlap to any extent.

1851 *E. contrahens* Wlk. Distribution statewide. July and August. Rare to common.

1857 *E. uniformis* Sm. One specimen each from Hamilton, Bozeman and Malta in July and August.

Nephelodes Guen.

1864 *N. pectinata* Sm. One specimen from Bozeman, Aug. 30, 1908, is in the Smith collection. Others have probably been recorded as *tertialis* Sm.

1865 *N. tertialis* Sm. Statewide in distribution. August-September. Common. Our material has all been carried under this name although I can see absolutely no distinction between this form and the eastern *emmedonia* Cram.

Stretchia Hy Edw.

1872 *S. variabilis* Sm. Three specimens from Bozeman April 27 to May 7, 1928.

Xylomiges Guen.

1883a *X. crucialis peritalis* Sm. One specimen from Bozeman, May 21, 1928.

1885a *X. curialis indurata* Sm. Quite common at Hamilton in 1928 and 1929. April-May. One specimen from Bozeman May 20, 1928.

1885b *X. curialis nicalis* Sm. Sixteen specimens from Hamilton Apr. 26 to May 17, 1928. One from Bozeman, May 26, 1928.

1887 *X. dolosa* Grt. Three specimens from Hamilton in April and May.

1888 *X. rubrica* Harv. Common in Pacific slope region, rare elsewhere. May-June. It seems probable that this species normally winters as a pupa, but like *Barathra configurata,* a few specimens may emerge in the fall, which would account for the date recorded for *rubricoides.*

1888a *X. rubrica rubricoides* B. & B. One specimen from Hamilton, Sept. 18, 1929.

Perigrapha Led.

1895 *P. normalis* Grt. Five specimens from Hamilton in April and May.

Orthosia Ochs.

1919 *O. hibisci* Guen. Intermountain and Pacific slope regions. April-June. Common.

Sideridis Hbn.

1926 *S. rosea* Harv. Fairly common in Intermountain and northern Plains regions, rare elsewhere. May-June.

Ceramica Guen.

1930 *C. picta* Harr. Fairly common in the northern Plains region, rare elsewhere. June-August.

Cirphis Wlk.

1935 *C. commoides* Guen. Statewide in distribution, rare everywhere. June-August.

1936 *C. phragmatidicola* Guen. Two specimens from Bozeman in August.
1941 *C. insueta megadia* Sm. Occurs everywhere except in southern Plains region and is most common in the Pacific slope and Intermountain regions. June-July. It seems probable that the other forms *heterodoxa* Sm. and *dia* Grt. also occur.
1942 *C. anteroclara* Sm. Intermountain and Pacific slope regions. July-August. Common.
1945 *C. calgariana* Sm. Pacific slope region. June-July. Common. Two specimens from Bozeman in July.
1950 *C. unipuncta* Haw. Statewide in distribution, most common in the southern Plains region. This is the true eastern army worm and a single outbreak of it is recorded from the Billings district in August 1915.

Neleucania Sm.

1959 *N. albilinea* Hbn. Statewide in distribution. June-September. Fairly common everywhere. Both a dark and light form occur but no attempt has been made to connect them with the varietal names.

Zosteropoda Grt.

1967 *Z. hirtipes* Grt. Six specimens from Hamilton in June and July.

Leucania Ochs.

1968 *L. rubripallens* Sm. One specimen from Malta, July 14, 1928 and one from Hamilton, Aug. 12, 1929.
1971 *L. minorata* Sm. Intermountain and Pacific slope regions. July-August. Abundant.

CUCULLIINAE

Copicucullia Sm.

1976 *C. propinqua* Sm. Intermountain and Pacific slope regions. May-June. Rare.

Rancora Sm.

1982 *R. strigata* Sm. Intermountain and Pacific slope regions. May-June. Rare.

Cucullia Schrank

1991 *C. dorsalis* Sm. One specimen from Bozeman, July 14, 1912, was identified as "near *dorsalis*" by Barnes and Lindsay.
1992 *C. speyeri* Lint. Intermountain region. June-July. Rare.
1997 *C. intermedia* Speyer. Common in Intermountain region, rare elsewhere. June-July. It is possible that the name *cinderella* Sm. should apply to these specmens but McDunnough states that he can find no difference between this material and eastern *intermedia*. We have one or two specimens from Quebec in our collection which are identical with the Montana material.
1998 *C. montanae* Grt. Six specimens from Three Forks and Hamilton in July and August. This species and the three which follow are very closely similar and it is possible that the reports have been somewhat mixed. The larva of *montanae* is a green and white striped worm which is often found feeding on the flowers of rabbit brush at night in the Three Forks region.

(To be continued)

NEW CANADIAN COLEOPTERA.—I.

BY F. S. CARR,
Medicine Hat, Alta.

Agabus bryanti n. sp.

Length 7 mm.; width at the humerus 3.2 mm. Elongate, with the sides of the elytra almost parallel. Black with a slightly aeneous lustre; the lateral bead of the pronotum, the sides of the elytra and the two spots on the head, reddish; the labrum is cream; the antennae are pale with the apices of the segments beginning with the sixth, infuscate; the palpi are pale with very slightly infuscate apices; the legs and coxae are pale red with the femora darker. The under surface is black except for the posterior borders of the abdominal segments which are narrowly reddish. The pronotum is notably unicolorous except for the marginal bead.

The antennal joints from the fifth to the tenth inclusive, are distinctly serrate; the eleventh joint is elongate and pointed, longer than any other joint.

The series of large punctures on the elytra are very distinct in the male and are regular in arrangement; in the female allotype the punctures are more confused. The reticulation is moderately fine, evident and of the same size in the male and the female; the meshes vary but little over the elytral surface.

The prosternal process is abruptly flattened and expanded posterior to the front coxae, the portion anterior to the coxae being almost carinate. The apex of the process is acuminate.

The anterior tibiae are broadly expanded from the femoral joint anteriorly, forming a triangularly shaped surface. The tarsi are markedly cylindrical in both sexes. The fifth is long, almost as long as the second, third and fourth. The tarsal modifications in the male characterize the species;—the joints are swollen considerably but still cylindrical; the fifth joint has on its lower surface a large tooth whose posterior edge slopes gradually to the inner end of the joint but whose anterior edge is more or less abrupt. The lower surfaces of joints one, two, three and four are almost bare, a few coarse hairs being found on two and three. The claws are flattened, pointed, of the same size and shape and with sinuate margins. The claws are bent inward at an obtuse angle to their insertion in the fifth joint.

Holotype.—Male; Shingle Point, Y.T. August 29, 1929. Mackenzie River 1929 Trip, Lot 1, Owen Bryant Collector. Number 3207 in the Canadian National Collection.

Allotype.—Female, same data.

Paratypes; fifteen males and twenty-three females. Specimens of the paratypes will be placed in the U.S.N.M.

"Shingle Point, Y.T. On the Arctic Ocean 40 miles west of the mouth of the west channel of the Mackenzie river delta. Date August 29, 1929. Arctic tundra, elevation 100 ft, near the coast. Dytiscids in a small pool in arctic tundra among the sphagnum and grass at edge of pool." (Extract from Mr. Bryant's diary).

This species is readily distinguished in the male by (1) the serrate antennae, (2) the swollen cylindrical tarsal joints, (3) the conspicuous tooth on the fifth tarsal joint, (4) the flattened claws. It is not allied closely to any other

species so far described from Canada, but appears to be nearest *elongatus* Gyll., found in northern Europe. From Sharp's remarks on *elongatus* Gyll., *bryanti* Carr differs as follows:—the front claws are more expanded, the greater extent of the serrate condition in the antennae, (in *elongatus* neither joints five nor ten are serrate).

The discovery of this species is due to Mr. Bryant's indefatigable collecting while in the Arctic last year.

Brachytarsus annulatus n. sp.

Length from the anterior margin of the pronotum to the apex of the elytra, 3.75 mm. The shape is broad, making the appearance stout and blocky, even for the genus. The sides of the elytra are almost parallel; the humeri are oblique, almost truncate. The elevated posterior margin of the pronotum is very distinct.

The head is punctate, but less coarsely than the pronotum. The antennae are light testaceous except for the very loose club which is black. As usual, joints one and two are thick, long and equal in size; joints three to eight inclusive are narrow and equal in size.

The pronotum is closely punctate with very coarse shallow punctures, separated by very narrow spaces. The posterior angles are slightly acute. The width of the base is one and one third the greatest dorsal length of the pronotum.

The striae of the elytra are impressed and irregularly punctate; the intervals are finely punctate.

The under surface is black and covered with gray hairlike scales. The legs are black and also covered with gray scales, which are interrupted on the tibia by two rings of black scales on each tibia. The tarsi are dark testaceous. The covering of the upper surface is distinctive; The chief vestiture is of gray scales, with well marked patterns in a black or brown almost black. A few brown scales are found in the scutellar and sutural regions. The head is covered with gray scales. On the pronotum are five longitudinal lines of gray scales,—one median, two lateral, and one on each side between the median and the lateral lines. Transversely three lines run, one on the anterior margin, one on the posterior margin and one halfway between. The spaces between are filled with the blackish brown scales. The elytra are covered with gray scales variegated with spots of the dark scales; a large spot each side of the scutellum reaching the base; a spot covering each humerus; a very large spot half way between the base and the apex of the elytra and numerous small spots, scattered over the elytra.

Holotype.—Medicine Hat, Alta., 27-V-1928; F. S. Carr, collector-sagebrush. Number 3206 in the Canadian National Collection.

Paratypes will be placed in the U.S.N.M.

This species has been collected in some numbers from a small area covered with sagebrush which is infected with a fungus disease. Whether the association has any significance has not been determined. This beetle is closely related to *alternatus* Say. It is distinguished by the color of the legs, by the very coarse punctures of the pronotum and by the vestiture. The arrangement of the vestiture varies considerably in the series studied as to the width of the gray lines on the pronotum.

NOTES AND DESCRIPTIONS OF SPECIES OF ARCTOCORIXA FROM ONTARIO AND QUEBEC (HEMIP., CORIXIDAE).*

BY G. STUART WALLEY,
Ottawa, Ont.

The literature contains but few definite records of Corixidae from Eastern Canada although many species have been described from adjacent territories and without doubt are present in the Canadian fauna. Recent collecting at various points in Ontario and Quebec has resulted in procuring new records for several species of *Arctocorixa*. The following constitutes a preliminary list of the *Arctocorixa* species of this region. The descriptions of three new species and a key to the males of all the species here recorded, are also included. Species previously unrecorded from Canada are marked with an asterisk. Collectors are indicated by initials as follows:—

A. A. W.=A. A. Wood	J. I. B.=J. I. Beaulne
G. B.=G. Beaulieu	J. McD.=J. McDunnough
G. H. F.=G. H. Fisk	L. J. M.=L. J Milne
G. S. W.=G. S. Walley	W. E. W.=W. E. Walton
J. A. A.=J. A. Adams	W. J. B.=W. J. Brown
J. D. E.=J. D. Evans	W. S. O.=W. S. Odell

**Arctocorixa alternata* (Say)—Ont.: Ottawa, Aug. 18, 1914 (G. B.). Que.: Montreal Isl., May 17, 1903 (G.B.); St. Jean, Sept. 15, 1916 (J.I.B.).

**Arctocorixa atopodonta* Hungfd.—Ont.: Mer Bleue, May 28 (G. S. W.): Ottawa, Aug. 28 (J.I.B.); Trenton, July 21, 1901, at light (J.D.E.). Que.: Kazubazua, July 18, 1927 (G.S.W.), Aug. 20, 1928 (G.H.F.). This species is known in literature as *A. dubia* Abb. Hungerford (1927) proposed the new name pointing out that *dubia* Abb. was preoccupied by *dubia* D. & S. The species is common at Kazubazua, Que. The Mer Bleue specimens were taken in pools located in a peat bog.

Arctocorixa bilineata Prov.—Ont.: Britannia, May 8, 17, 1927 (G.S.W.); Rondeau, June 1, 1926 (A.A.W.). Que.: Aylmer, June 6 (G.S.W.). For further notes on this species vide Can. Ent., LXI, 34, 1929.

**Arctocorixa decoratella* Hungfd.—Ont.: Ottawa, July 18, 1913 (J.I.B.). Que.: Natashquan, Aug. 11, 1929 (W.J.B.); Watshishu, June 18, 1929 (W.J.B.).

**Arctocorixa kennicottii* (Uhl.)—Ont.: Jock River, May 21, 1927 (G.S.W.); Ottawa, May 21, 1928 (W.J.B.); Point Pelee, June 3, 5, 6, 1929 (G.S.W.). Que.: Brome Lake, July 8, 1927 (G.S.W.); Fairy Lake, Aug. 7, 1927 (W.J.B.). Common in the Ottawa region where it has been dredged from among *Typha* debris in marshy ponds. Easily distinguished from the other species in this region by the non-lineate uniformly pale brownish membrane.

**Arctocorixa lucida* Abb.—Ont.: Point Pelee, June 3, 5, 6, 1929 (L.J.M.; G.S.W.). Occurs sparingly in a large marsh at Point Pelee. One pair of specimens were taken in copulo (June 5). Hitherto recorded only from R. Id., Mass. and Conn.

**Arctocorixa mackinacensis* Hungfd.—Ont.: Arran Lake (near Southampton), Sept. 13, 1927 (G.S.W.).

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*Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

**Arctocorixa michiganensis* Hungfd.—Que.: Kazubazua, July 20, Aug. 18, 1927 (G.S.W., W.J.B., G.H.F.), Aug. 28, 1928 (W.J.B.). Dredged in large numbers from a shallow sand bottomed lake.

**Arctocorixa minorella* Hungfd.—Que.: Kazubazua, July 17, Aug. 16, 1927 (W.J.B., G.S.W.), Aug. 28, 1928 (W.J.B.). Rare.

**Arctocorixa modesta* Abb.—Ont.: Abitibi Lake, Aug. 16, 1913 (W.S.O.); Jock River, May 20, 1929 (G.S.W.); Ottawa, May 16, 1927. Found commonly frequenting the shores of the Rideau and Ottawa rivers.

**Arctocorixa ornata* Abb. Ont.: Jock River, May 21, 1927 (G.S.W.); Ottawa, Apr. 16, 1927 (G.S.W.). Que.: Fairy Lake, May 3, 1927, Sept. 11, 1928 (G.S.W.) Occurs commonly in the Ottawa district in the same environment as *A. kennicottii*.

**Arctocorixa seriata* Abb. Que.: Kazubazua, July 20, 1927 (G.S.W.); Natashquan, June 21, 22, Aug. 5, 11, 1929 (W.J.B.).

Arctocorixa trilineata Prov.—Ont.: Arnprior, Sept. 1929 (G.S.W.); Britannia, May 10, 1927 (G.S.W., W.J.B.); Minaki, June 30, 1928 (J. McD.); Point Pelee, June, 1929 (L.J.M.). Que.: Aylmer, June 7, 1927 (G.S.W.). For further notes on this species vide Can. Ent., LXI, 36, 1929.

**Arctocorixa variabilis* Hungfd.—Ont.: Jock River, May 21, 1927 (G. S. W.); Ottawa, Apr. 16, 1927 (G.S.W.). Que.: Fairy Lake, May 16, 1927 (W.J.B.).

**Arctocorixa vulgaris* Hungfd.—Ont.: Ottawa, April 16, 1927 (G.S.W.); Ventnor, June, July, Aug. 1928 (J.A.A.). Que.: Fairy Lake, May 3, 1927 (G.S.W.); Montreal Isl., June 21, 1903 (G.B.); St. Jean, Sept. 10, 1915 (J.I.B.).

**Arctocorixa chanceae* Hungfd.—Que.: Watshishu, June 18, 1929, (W.J.B.); Mecatina Sanctuary, July 9, 1929 (W.J.B.); Greenley Isl., June 20, 1929, (W.J.B.); Bradore Bay, July 27, 1929 (W.J.B.).

**Arctocorixa convexa* (Fieb.)—Que.: Thunder River, June 10, 1929 (W.J.B.); Musquaro, Bragg Harb., June 24, 1929 (W.J.B.); Wolf Bay, June 25, 1929 (W.J.B.); Fog Isl. Sanctuary, June 25, 1929 (W.J.B.); Bonne Esperance, July 14, 1929 (W.J.B.).

Arctocorixa harrissii Uhl.—According to Hungerford (Bul. Brookl. Ent. Soc. XX, 141, 1925) this is a valid species. Van Duzee (Cat. Hem.) lists an "Ont." record and the species probably occurs there though there are no specimens at hand on which to base a further record.

Arctocorixa calva Say—Another species listed by Van Duzee as occurring in Ont., but apparently not subsequently recorded.

Arctocorixa quebecensis n. sp.

Figs. 1a, 1b, 1c, 1d.

Male.—Length 4.5 mm. Slender. Head broadly rounded embracing the short pronotum as in *A. michiganensis* Hungfd.; from above, median length: width as 11:34. Face with only a small oval flattened area distinctly narrower than distance between eyes and scarcely attaining a point even with their lower margins. Pronotum and elytra very faintly rastrate; disk of pronotum with median length: width as 15 : 31. Lateral lobe of prothorax as in fig. 1c. Metaxyphus as in fig. 1d, the apex extending to middle of hind coxae. Front leg of ♂ as in fig. 1a. Front femora moderately stout, stridular area not extending be-

yond middle, composed of 6-7 rows short bristles. Tibia with apical lobe inwardly and a few weak apical bristles. Pala as in fig. 1a with a single curved row of 20-23 short pegs; bristles in row below pegs somewhat longer than usual. Middle legs proportioned, femur 45 : tibia 20 : tarsus 14 : claws 16. Hind legs proportioned, femur 25 : tibia 25 : first tarsal 30 : second tarsal 12. Strigil twice as long as broad, 5-6 striae. Right clasper as in fig. 1b.

General color dark reddish brown, the usual paler yellow markings sometimes reddish tinged. Head, bases of legs and pleura yellowish brown, legs more brownish apically, coxae, thoracic and basal abdominal sternites dark brownish. Pronotal disk with 5-6 broad slightly interrupted transverse (reddish brown) bars which extend to lateral margins the black intervals abbreviated or interrupted laterally. Clavus black with a few evenly distributed angular (reddish brown) blotches; corium similarly marked; membrane brown tinged with reddish with a few paler areas faintly indicated.

Female.—Slightly more robust than the male, similarly marked, differing otherwise only sexually.

Holotype—♂, Knowlton, Que., July 6, 1929 (Walley); No. 3095 in the Canadian National Collection, Ottawa.

Allotype—♀, same data as holotype.

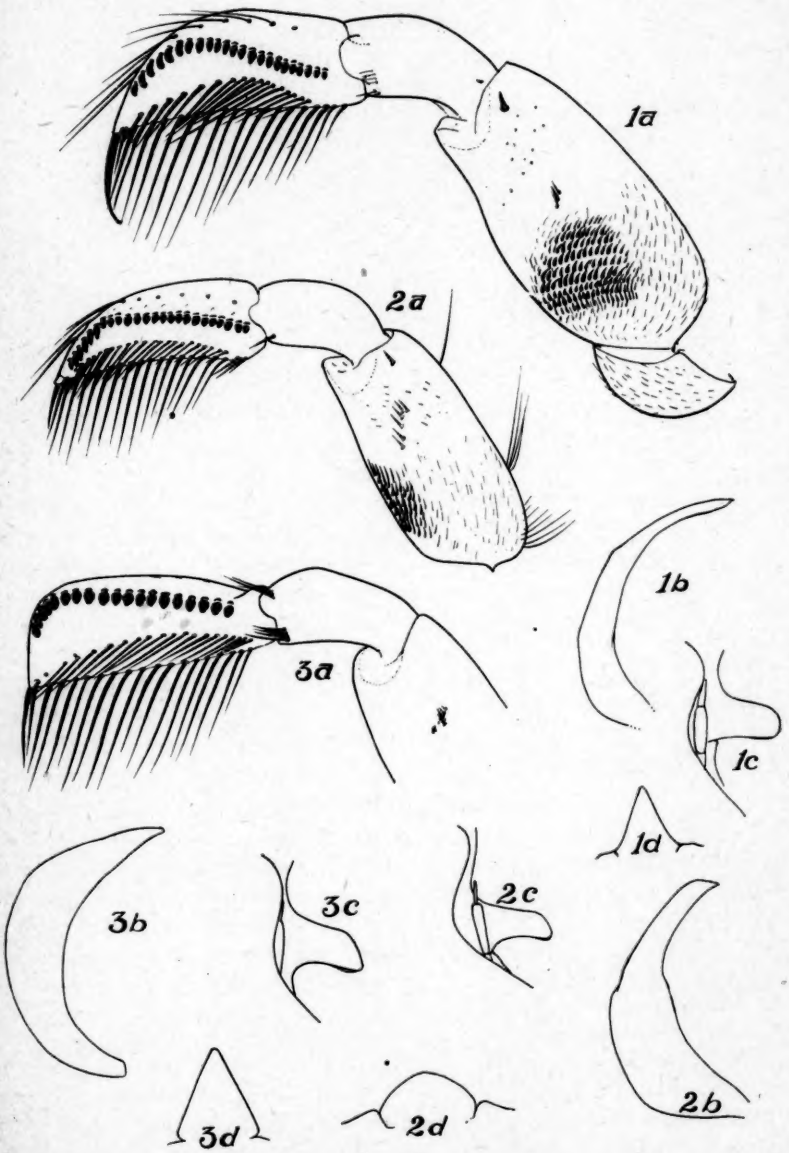
Paratypes—6 ♂♂, 10 ♀♀, Knowlton, Que., July 6-8, 1929 (Walley.)

Arctocorixa transfigurata n. sp.

Figs. 2a, 2b, 2c, 2d.

Male.—Length 5.4 mm. Rather narrow and elongate with facies of a *Palmacorixa;* head long, overlapping prothorax, metathoracic wings aborted, much shorter than abdomen, elytral membrane scarcely developed, male genitalia and palar structure as in *Arctocorixa.*

Head from above rather obtusely pointed, inner margins of eyes converging posteriorly and lateral angles of head prolonged to embrace sides of the short pronotum. Front with median oval depression just surpassing lower margin of eyes and distinctly narrower than inter-ocular space, in profile continuous with rounded vertex. Vertex with a low carina, most distinct posteriorly. A line of punctures on either side carina, a confused double row adjacent inner margins of eyes and a few scattered punctures on vertex and above facial depression. Disk of pronotum unusually short, almost three times as broad as long, distinctly rastrate on entire surface, a pale medina carina and three transverse pale lines slightly elevated. Lateral lobe of prothorax as in fig. 2c, distinctly longer than broad, apex obliquely truncate. Metaxyphus as in fig. 2d, very short, with apex broadly obtuse. Front femora rather slender with usual stridular area, tibia rather short carinate above, pala, as in fig. 2a with upper margin broadly arcuate on basal two-thirds thence rounded to moderately acute apex, 24 pegs in a single row which begins in middle near base and runs upward and outward in an almost straight line to join upper margin at apical third, beyond curved parallel to margin; basal pegs short and stout, apical 6-7 pegs of curved portion distinctly longer. Metathoracic wings abbreviated not extending beyond apex of fourth abdominal tergite. Clavus and corium heavily and rather coarsely rastrate throughout except for the much reduced membrane; transverse pale lines on corium



SPECIES OF ARCTOCORIXA

1a - *A. quebecensis* n. sp., front leg of ♂ ; 1b - right ♂ clasper of same; 1c - lateral prothoracic lobe of same; 1d - metaxyphus of same. 2a - *A. transfigurata* n. sp., front leg of ♂ ; 2b - right ♂ clasper of same; 2c - lateral prothoracic lobe of same; 2d - metaxyphus of same. 3a - *A. semilucida* n. sp., front leg of ♂ ; 3b - right ♂ clasper of same; 3c - lateral prothoracic lobe of same; 3d - metaxyphus of same.

slightly elevated above black interspaces. Strigil small, twice as long as broad, 4-5 striae. Right clasper as in fig. 2b.

General color black with ground color of head, legs and venter brownish yellow. Vertex with a faint median brownish suffusion which extends transversely at the base and broadens to form a faint spot at apex. Meso- and meta-coxae, meso- and meta-sterna and basal abdominal sternites brownish tinged with reddish. Legs yellow, hind tibiae and tarsi slightly brownish. Pronotum shining black with a yellowish median carina and three narrow transverse arcuate yellow lines which converge laterally, the median one often divided near median carina. Clavus largely shining black with 3 or 4 rather broad oblique yellow dashes on basal third and 3 or 4 narrower, shorter, more irregular ones beyond. Corium shining black, base with a few yellowish transverse dashes which become more distinct posteriorly at apex of clavus; apex of corium with more numerous smaller irregular yellowish flecks which invade the small membrane area. Embolium and costal margin beyond around apex of wing dark brownish.

Holotype—♂, Knowlton, Que., July 8, 1929 (Walley); No. 3127 in the Canadian National Collection, Ottawa.

Allotype—♀, same data as holotype.

Paratypes—5 ♂♂, 21 ♀♀, Knowlton, Que., July 6-8, 1929 (Walley); ♂, 4 ♀♀, Ottawa, Ont., April 16, 1927 (Walley); ♀, Fairy Lake, Que., May 14, 1927 (Walley).

Notes—In some specimens the head is completely suffused with reddish brown pigment while in others the venter is wholly yellowish not with brownish as above.

The specimens from Ottawa and Fairy Lake differ slightly from the constantly marked Knowlton series. The former present a slightly paler appearance due to the fact that the pale elytral and pronotal cross bars are slightly broader and a little more regular than in the Knowlton series.

Arctocorixa semilucida n. sp.

Figs. 3a, 3b, 3c, 3d.

Male.—Length 7mm. Rather robust. Head broadly rounded. Face with a small oval faintly granular depression which slightly surpasses lower margin of eyes. Finely rastrate pronotal disk twice as broad as long, posterior margin broadly rounded. Lateral lobe of prothorax as in fig. 3c. Metaxyphus as in fig. 3d. Pala resembling that of *A. lucida* Abb. with a single row of short stout pegs which gradually approaches upper margin outwardly, the last five pegs attaining outer margin just before truncate apex, tibia with upper margin carinate before apex, 4 or 5 rather strong bristles in a close set row at lower apical extremity, 2 or 3 more slender longer bristles at upper apical extremity, fig. 3a. Clavus and base of corium very obscurely rastrate. Strigil small, three times as long as broad with 5 striae.

General color blackish, the usual paler markings reddish except on head and below. Pronotum with 8 entire transverse blackish bands separated by slightly narrower reddish brown bands. Clavus black with marginal lines, a few larger flecks at base and small scattered flecks on middle and apex, reddish. Corium

with reddish markings reduced to small flecks which arrange themselves in three sparse rows, the inner row paralleling the claval suture and terminating just beyond apex of clavus. Inner margin of embolium and beyond reddish; the dark brownish membrane with a few flecks separated from corium by a distinct broad reddish dash. Venter blackish, sternites obscurely pale on lateral margins.

Holotype—♂, Point Pelee, Ont., June 6, 1929 (Walley); No. 3128 in the Canadian National Collection, Ottawa.

Allotype—♀, same data as holotype.

Paratypes—10 ♀♀, Point Pelee, June 3-6, 1929 (Milne and Walley).

Notes—In all specimens at hand the paler markings are consistently reddish as remarked above. The female differs in being slightly larger and more robust than the male.

The species was dredged from among *Typha* debris in a large marsh bordered pond in company with specimens of *A. lucida* Abb. In nature the two species possess a markedly similar appearance. *Lucida*, however, is distinctly larger and differs in having a longer and more acutely pointed metaxphyus, different genitalia in the male and a distinctive elytral color pattern (vide Blatchley, Heter. E. N. Am., p. 1064, 1926, fig. 3).

The following key is provisionally included to assist in identifying the species recorded above. In general the key is based on male palar and genital characters and striking color differences, an attempt being made to avoid introducing distinctions based on obscure color characters. Nearly all the structural details mentioned are illustrated, usually in company with the original description of the species, but sometimes by subsequent authors.

KEY TO SPECIES

1. Metaxyphus very short, much broader than long (fig. 2d), apex broadly obtuse, hind wings aborted ..... *transfigurata* n. sp.
   Metaxyphus usually distinctly longer than broad (fig. 3d), apex less than a right angle, hind wings fully developed 2
2. Hemelytral pattern consisting of 2 or 3 longitudinal black stripes on a ..... yellow field 3
   Hemelytral pattern consisting of undulate transverse yellow lines scattered flecks or flecks in longitudinal series but never 2 or 3 longitudinal black stripes 4
3. Hemelytra with 2 black stripes; length not greater than 4.2 mm. .... *bilineata* Prov
   Hemelytra with 3 black stripes; length 6 mm. or more .... *trilineata* Prov.
4. Outer margin of corium adjacent to embolium broadly pale .... *lucida* Abb.
   Outer margin of corium adjacent to embolium with at most a narrow pale line 5
5. Male pala with apex acute (fig. 1a) 12
   Male pala with apex truncate (fig. 3a) (except in *mackinacensis*) 6
6. Male pala obliquely truncate, the upper margin produced slightly beyond the lower .... *vulgaris* Hungfd.
   Male pala with lower margin as long as upper, usually squarely truncate ..7

7. Male pala with a single stout peg at distal end of row not in line with other pegs ..... *atopodonta* Hungfd.
Male pala with a single row of pegs without the above "extra" peg at end of row 8

8. Right clasper of male with a small emargination at tip ..... *mackinacensis* Hungfd.
Right clasper of male not emarginate at apex, sometimes acutely pointed or lobate 9

9. Male pala short, not more than one and one half times as long as broad ..... *variabolis* Hungfd.
Male pala at least twice as long as broad 10

10. Right clasper of male lobate at apex ..... *minorella* Hungfd.
Right clasper of male acutely pointed at apex 11

11. Pale flecks on corium arranged in two irregular longitudinal series ..... *semilucida* n. sp
Pale flecks on corium not at all arranged in longitudinal series ..... *michiganensis* Hungfd.

12. Male pala with pegs in two distinct rows or with about 35 pegs in a single row which is interrupted just before middle 13
Male pala with pegs in a single continuous row 14

13. Male pala with pegs in two distinct rows; pronotum elongate 12-13 transverse black lines and a medium carina distinct except at apex ..... *chanceae* Hungfd.
Male pala with about 35 pegs in a single interrupted row; pronotum normal 4-6 transverse black lines and with only faint carina on anterior fourth ..... *ornata* Abb.

14. Pronotum elongate with percurrent median carina; length 9-11 mm. ..... *convexa* (Fieb.)
Pronotum normal without a percurrent median carina; length variable .. 15

15. Length not exceeding 5 mm. 16
Length not less than 7 mm. 18

16. Male pala not over one and one half times as long as broad; robust species ..... *seriata* Abb.
Male pala more than twice as long as broad; rather slender species 17

17. Membrane brownish with only faint traces of maculation; corium black with a few pale dashes which form 2 obscure series ..... *quebecensis* n. sp.
Membrane with numerous distinct pale flecks; corium with numerous transverse pale dashes not arranged in series ..... *modesta* Abb.

18. Membrane brownish with only faint traces of maculation at base; length 9 mm. ..... *kennicottii* Uhl.
Membrane distinctly maculate; length not exceeding 8 mm. 19

19. Male palar pegs in row remote from upper margin except at apical fourth of row; pala more than three times as long as broad .... *decoratella* Hungfd.
Male palar pegs in row close to upper margin; pala less than three times as long as broad ..... *alternata* (Say)

A NEW GYMNOPTERNUS FROM OREGON. (DOLICHOPIDAE, DIPTERA).

BY C. H. CURRAN,
American Museum of Natural History, New York.

The Dolichopod herewith described belongs to a genus containing a large number of species having very similar form. The new form is related to *tristis* Loew but is readily distinguished by the wholly black legs.

Gymnopternus vanduzeei n. sp.

Legs wholly black; genital lamellae blackish, subtriangular; wings smoky. Length, 3 to 3.25 mm.

Male. Face silvery, of moderate width; above the oral margin with black hair and with a single row of shorter hair extending up the middle of the face. Front green, darker in the middle. Occiput green, thinly cinereous pollinose, the orbital bristles black. Palpi brownish. Antennae black; third segment a little longer than wide, convex below, rather angled above at apex; arista sub-basal.

Thorax dark green; pleura and notopleura cinereous pollinose; mesonotum and scutellum with very thin brown pollen; scutellum with one pair of bristles and obscure brownish hair.

Legs black or brownish black, the tips of the femora reddish; coxae gray pollinose, with black hair; basal segment of posterior tarsi distinctly shorter than the second.

Wings smoky. Squamae yellow, with black cilia. Knob of halteres yellow.

Abdomen dark green, the immediate sides and venter gray pollinose, venter brown or black, pale haired, the dorsum with black hair, the apices of the segments with poorly differentiated bristles. Genitalia moderately short, rather thick; lamellae blackish, subtriangular, the upper corner broadly rounded; bordered with sparse black hair, the lower surface with fine, short yellowish hair.

Female. Face as wide as the front; third antennal segment as broad as long; venter black haired.

Described from 18 males and one female from Hood River, Ore., (Childs); and two females, Cascadia, Ore., (H. A. Scullen). The holotype is a male from Hood River, the allotype a female from Cascadia.

This species is related to *tristis* Loew but is at once distinguished by the wholly black legs, smaller size and differently shaped genital lamellae.

BOOK NOTICE

The Coconut Moth in Fiji—A History of its Control by Means of Parasites, by J. D. Tothill, D. Sc., assisted by T. H. C. Taylor, B. Sc., and R. W. Paine, B. A., London, Eng., published for the Government of Fiji by the Imperial Institute of Entomology, London, England.

This splendid volume of 269 pages was recently issued by the Imperial Institute of Entomology. It should be of special interest to Canadian entomologists in view of the fact that the senior author, Dr. J. D. Tothill, was for many years attached to the Dominion Entomological Service. Since his departure from Canada, his success has been followed closely by many of his former colleagues.

The volume begins with a historical sketch of the insect *Levuana irridescens,* followed by a general account of the campaign instituted in 1925. The next chapter discusses the taxonomy of the moth, its origin, natural habitat, food plants, injurious nature, life-history, etc. This is followed by chapters which discuss the tachinid fly, *Ptychomyia remota;* allied zygaenids and their natural control; *Trichogrammatoidea nana,* and the predacious beetle, *Callimerus arcufer.*

As a result of the control of the Coconut Moth by parasites, the authors state that "the threat of disaster overhanging Vanua Levu, Taveuni and Lau has been removed; Ovalau and nearby islands are now producing their normal 500 tons of copra, and, what appears to be of greater importance, the hitherto non-productive island of Viti Levu, which is about the size of Jamaica, is now producing copra, and the natives have commenced to plant up actively in a campaign energized by the Secretary for Native Affairs."

The volume, while of particular value to those interested especially in the biological method of pest control, will be welcomed by entomologists generally. We compliment the authors on their achievements and also the Imperial Institute of Entomology, for making known the scientific results of the investigations.

Several beautiful full-paged coloured plates, and many half-tone plates are included in the volume, in addition to numerous text figures. The arrangement of the subject matter is excellent and the printing is all that could be desired.

ARTHUR GIBSON.

MAILED MONDAY, DECEMBER 29TH, 1930.

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